

Applicant: Kaisa Putkisto et al.
Application No.: 10/507,417
Response to Office action dated May 2, 2006
Response filed August 1, 2006

Claim Listing

1-4. (cancelled)

5. (currently amended) A method for coating a paper or board web in a dry surface treatment process comprising the steps of:

pre-charging particles of a dry powder within a charging unit by causing the dry powder to move between an first electrode producing [[a]] corona charging charge within the unit and an second electrode at a lower or opposite potential within the charging unit to form pre-charged particles;

supplying the pre-charged particles from the charging unit to a feeding nozzle which forms forming an third electrode and blowing the pre-charged particles from the feeding nozzle toward the paper or board web, the feeding nozzle being positioned between afourth an upstream electrode producing a corona discharge, the upstream electrode positioned outside of the charging unit and laterally space from and upstream of the feeding nozzle, and a fifth downstream electrode producing a corona discharge, the downstream electrode positioned outside of the charging unit and laterally spaced from and downstream of the feeding nozzle, wherein the feeding nozzle is spaced further from the paper or board web a first distance, and wherein than the upstream second electrode and the third downstream electrode are spaced from the paper or board web a distance which is less than the first distance;

wherein the paper or board web is backed by a grounding electrode at a potential which is lower than or opposite to the potentials of the feeding nozzle, the upstream electrode and the downstream electrode, forming the third electrode, the fourth electrode, and the fifth electrode, and wherein the feeding nozzle forming the third electrode, the fourth electrode, and the fifth electrode are located on a side of the paper or board web opposite the grounding electrode.

Applicant: Kaisa Putkisto et al.
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6. (previously presented) The method of claim 5 wherein the grounding electrode is a rotatable roll.

7. (previously presented) The method of claim 5 wherein the grounding electrode is a stationary platy electrode.

Applicant: Kaisa Putkisto et al.
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8. (currently amended) A method for coating a paper or board web in a dry surface treatment process comprising the steps of:

pre-charging particles of a dry powder by causing the dry powder to move along the walls of a transfer pipe to charge the particles by triboelectric charging;

supplying the pre-charged particles to a feeding nozzle forming ~~a first~~ an electrode and blowing the pre-charged particles from the feeding nozzle toward the paper or board web, the feeding nozzle being positioned between ~~a second electrode producing a corona discharge upstream of the feeding nozzle and a third electrode producing a corona discharge downstream of the feeding nozzle, wherein the feeding nozzle is spaced from the paper or board web a first distance, and wherein the second electrode and the third electrode are spaced from the paper or board web a distance which is less than the first distance~~ an upstream electrode producing a corona discharge, the upstream electrode positioned laterally spaced from and upstream of the feeding nozzle, and a downstream electrode producing a corona discharge, the downstream electrode positioned laterally spaced from and downstream of the feeding nozzle, wherein the feeding nozzle is spaced further from the paper or board web than the upstream electrode and the downstream electrode;

wherein the paper or board web is backed by a grounding electrode at a potential which is lower than or opposite to the potentials of the feeding nozzle ~~forming the first electrode, the second upstream electrode, and the third downstream electrode, and wherein the feeding nozzle, the second electrode, and the third electrode are located on a side of the paper or board web opposite the grounding electrode.~~

9. (previously presented) The method of claim 8 wherein the grounding electrode is a rotatable roll.

Applicant: Kaisa Putkisto et al.
Application No.: 10/507,417
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10. (previously presented) The method of claim 8 wherein the grounding electrode is a stationary platy electrode.

11. (currently amended) A method for coating a moving web using a dry surface treatment process wherein the movement of the paper web defines an upstream direction and a downstream direction, comprising the steps of:

pre-charging particles of a dry powder within a charging unit by causing the dry powder to move between an first electrode producing [[a]] corona charging charge within the unit and an second electrode at a lower or opposite potential within the charging unit to form pre-charged particles;

coating the web with a coating layer by supplying the pre-charged particles from the charging unit to a feeding nozzle which forms an third electrode and blowing the pre-charged particles from the feeding nozzle toward the web, the feeding nozzle being positioned between a fourth an upstream electrode producing a corona discharge, the upstream electrode positioned outside of the charging unit and laterally spaced from and upstream of the feeding nozzle and a fifth downstream electrode producing a corona discharge, the downstream electrode positioned outside of the charging unit and laterally spaced from and downstream of the feeding nozzle, wherein the feeding nozzle is spaced further from the web a first distance, and wherein than the upstream second electrode and the third downstream electrode are spaced from the paper or board web a distance which is less than the first distance; and

wherein the web is backed by a grounding electrode at a potential which is lower than or opposite to the potentials of the feeding nozzle, the upstream and the downstream electrodes forming the third electrode, the fourth electrode, and the fifth electrode, and wherein the feeding nozzle, forming the third electrode, the fourth electrode, and the fifth electrode are located on a side of the web opposite the grounding electrode.

Applicant: Kaisa Putkisto et al.
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12. (previously presented) The method of claim 11 wherein the grounding electrode is a rotatable roll.

13. (previously presented) The method of claim 11 wherein the grounding electrode is a stationary platy electrode.

Applicant: Kaisa Putkisto et al.
Application No.: 10/507,417
Response to Office action dated May 2, 2006
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14. (currently amended) A method for coating a moving web [[in]] using a dry surface treatment process wherein the movement of the paper web defines an upstream direction and a downstream direction, comprising the steps of:

pre-charging particles of a dry powder by causing the dry powder to move along the walls of a transfer pipe to charge the particles by triboelectric charging; supplying the pre-charged particles to a feeding nozzle forming ~~a first~~ an electrode and blowing the pre-charged particles from the feeding nozzle toward the web, the feeding nozzle being positioned between ~~a second electrode~~ producing a corona discharge upstream of the feeding nozzle and ~~a third electrode~~ producing a corona discharge downstream of the feeding nozzle, wherein the feeding nozzle is spaced from the paper or board web a first distance, and wherein the second electrode and the third electrode are spaced from the paper or board web a distance which is less than the first distance an upstream electrode producing a corona discharge, the upstream electrode positioned laterally spaced from and upstream of the feeding nozzle, and a downstream electrode producing a corona discharge, the downstream electrode positioned laterally spaced from and downstream of the feeding nozzle, wherein the feeding nozzle is spaced further from the paper or board web than the upstream electrode and the downstream electrode;

wherein the paper or board web is backed by a grounding electrode at a potential which is lower than or opposite to the potentials of the feeding nozzle forming the first electrode, the upstream second electrode, and the downstream third electrode, and wherein the feeding nozzle forming the first electrode, the second electrode, and the third electrode are located on a side of the paper or board web opposite the grounding electrode.

15. (previously presented) The method of claim 14 wherein the grounding electrode is a rotatable roll.

Applicant: Kaisa Putkisto et al.
Application No.: 10/507,417
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16. (previously presented) The method of claim 14 wherein the grounding electrode is a stationary platy electrode.